EPIC Pro Introduction

1.1 The GigaPan Solution

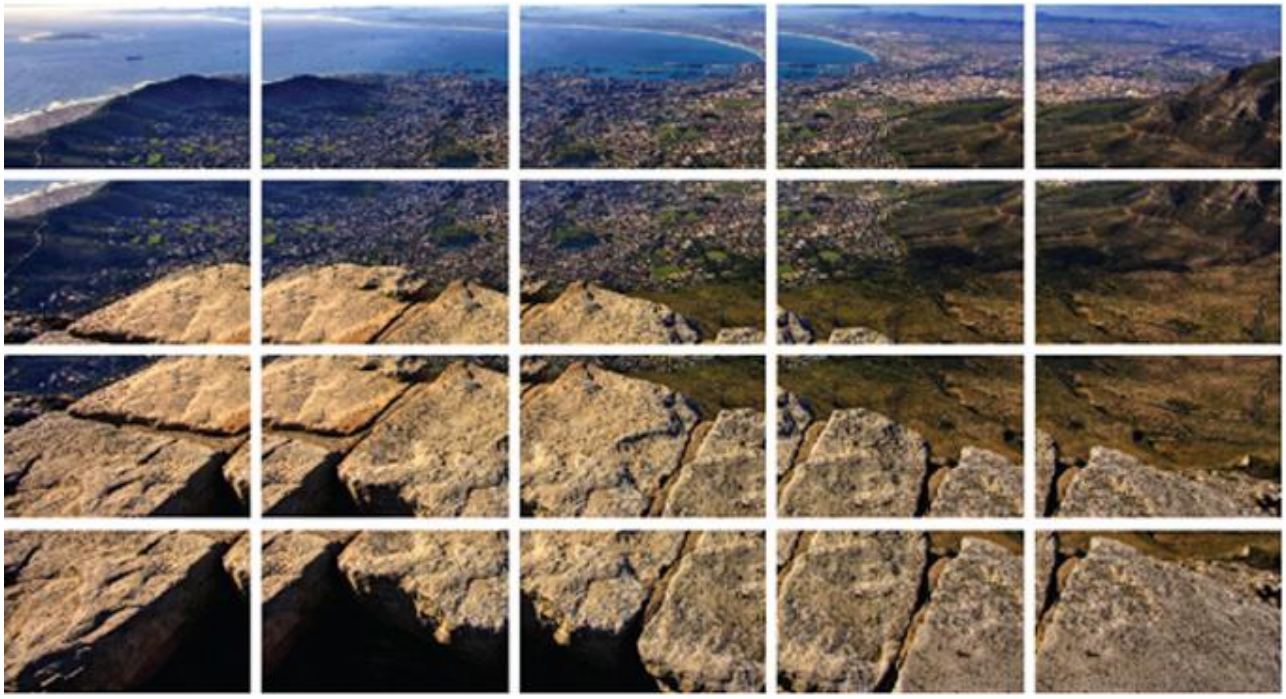
Capturing stunning gigapixel images is easy with GigaPan - a complete solution with integrated equipment, software and website. The GigaPan EPIC Pro works seamlessly with the GigaPan Stitch software and GigaPan.com to capture, upload and share gigapixel panoramas. Zoom into thousands of stunning panoramas from around the world with the amazing GigaPan Viewer. Join GigaPan.com to view and share with friends, take snapshots and embed panoramas on your own website.

Here is an overview of how easy and fun it is to use the GigaPan System, in 4 simple steps:

1. Pick a Scene
The GigaPan EPIC series automates the panorama-taking process by taking hundreds of images of the selected scene.

2. Click
The GigaPan EPIC automatically operates your camera to take a series of photographs of your scene.

3. Stitch
The Gigapan Stitch software assembles, aligns and blends the individual images into one large panorama.

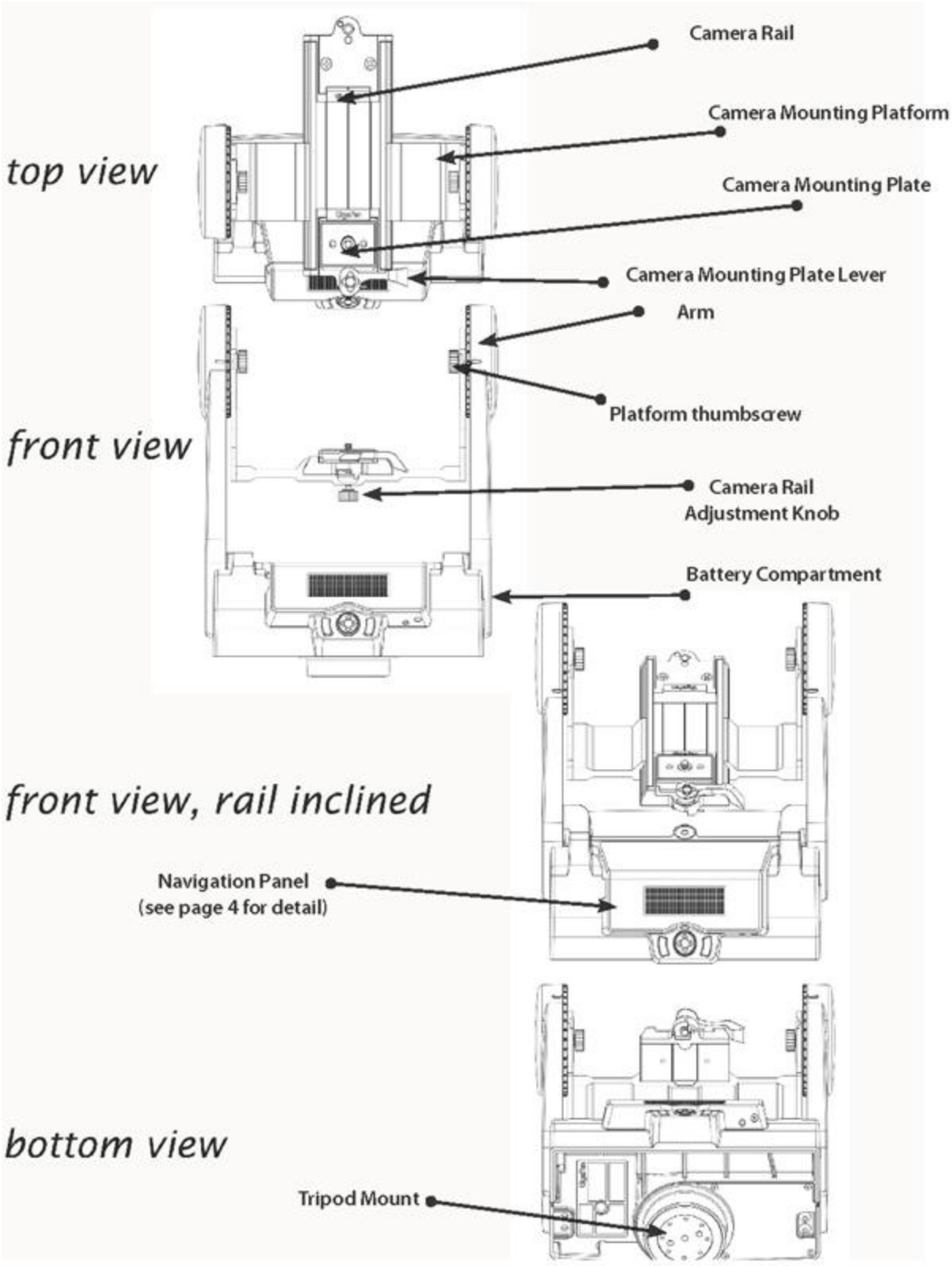


4. Share

GigaPan Stitch Software then uploads your panorama to GigaPan.com to share with friends and the GigaPan community. You also have the ability to embed your uploaded panorama onto any website.

1.2 GigaPan Epic Pro Parts

Please see Chapter 2: Setting Up the EPIC Pro for more information about how to adjust the EPIC Pro parts to fit your camera and lens.


top view
Camera Rail
Camera Mounting Platform
Camera Mounting Plate
Camera Mounting Plate Lever
Arm
Platform thumbscrew
front view
Camera Rail
Adjustment Knob
Battery Compartment
front view, rail inclined
Navigation Panel
(see page 4 for detail)
bottom view
Tripod Mount

Camera Rail - Holds the camera mounting plate and can be adjusted forward or back to accommodate the size of your camera and lens.
Rail Adjustment Knob - Loosen or tighten the knob to move the camera rail when mounting a camera and lens.
Camera Mounting Platform - Holds the camera rail and can be adjusted up or down to accommodate your camera. Platform Thumbscrews - Loosen or tighten the thumbscrews to move the camera mounting platform.
Camera Mounting Plate - Attaches to the camera or lens to mount it on the EPIC Pro.
Camera Mounting Plate Lever - Holds the camera mounting plate securely in place. Move the small silver pin below the lever clockwise and rotate the lever clockwise to release the camera mounting plate.
Navigation panel - Contains the LCD display and directional buttons for operating the EPIC Pro Menu.
Tripod Mount - Attaches the EPIC Pro to your tripod. Bubble Level - Measures that your EPIC Pro is level on your tripod and on the ground.
Battery Chamber - Holds the EPIC Pro battery. Turn the latch counterclockwise and pull it the battery holder away from the unit to remove it from the chamber.

Navigation Panel
LCD Display - Displays the EPIC Pro Menu. Directional Keys - Press up, down, left or right buttons to select items in the EPIC Pro Menu, or move the camera left to right and up or down to select parameters when shooting a panorama.
Cancel Button - Cancel selections in navigating the EPIC Pro Menu.
Power/OK Button - Hold down for a few seconds to power the EPIC Pro ON or OFF, or use to select items when navigating the Menu.
Trigger cable port - Use with electronic trigger cable to actuate the shutter and cause the camera to focus if you are using auto focus.
Remote trigger port - Use with a pocket wizard or a wireless shutter release that has a 2.5mm miniplug to trigger the EPIC Pro to capture a panorama.
Battery port - Plug the power cord into the battery port to charge the battery while it is in the EPIC Pro.
1.3 EPIC Pro Features
HIGHLIGHTS
DSLR camera compatible - EPIC Pro works with almost all digital DSLR cameras introduced after 2004.
Large lenses are supported - Camera and lens combinations of up to 10 lbs can be used with the EPIC Pro.
Precision accuracy - Powered camera movement and simple fore/aft up/down adjustment for optimal positioning of the nodal point and varied camera/lens combinations.
Quick set up - Easy to secure EPIC Pro to tripod. Fits standard tripods, with 1/4” or 3/8” thread. Onboard bubble level for horizontal alignment.
Clear and simple to navigate menu - Access frequently-used functions with the touch of a button, such as to move the camera or set the shutter delay. Screen is highly visible with back lit display.
Strong and durable yet lightweight - Excellent design with magnesium chassis and aluminum arm, the EPIC Pro weighs less than 8 lbs with battery pack.

SPECIAL FEATURES
Rechargeable battery pack (7.2V, 4300mAH) included - Charge the battery on its own or while inserted in the EPIC Pro, convenient for charging while shoot- ing. Charger included.
Multiple triggering option - Allows the EPIC Pro to take multiple pictures at each image location up to 20 times per position for exposure bracketing or multiple image enhancement.
Optimized range of motion - 360 panoramic and -65/+90 tilt range of motion with precision incremental movement.
Remote trigger port - Enables you to start taking a panorama from a different location using a remote trigger with a Canon E3 type connector. (not included).

Advanced settings include: option to repeat last panorama, pause and scroll, and order pictures as rows or columns.
Adjustable features include: time between exposures, pre trigger delay, focus assertion time (shutter length), motor speed, aspect ratio, and picture overlap.

1.4 Navigate the EPIC Pro Menu

Turn the EPIC Pro on by pressing the Power/OK button. The first menu option, 'New Panorama', will appear. To navigate to other menu options, push the down button. To reach submenus within a menu option, push the OK button once you reach the desired main menu option, then the down button to access the submenu choices. To exit a menu or submenu, push the X button.

EPIC Pro Menu Tree for Firmware Version 128.1

New Panorama
360 Panorama
Options
Time Per Pic

Start Del/Trig

Mult Shutter

Pic Order

Battery Status

Factory Reset

Expert Options

Checklist

Shutter Mode

Shutter Length

Motor Speed

Motors Rigid

Pretrigger Delay

Backlight Mode

Aspect Ratio

Picture Overlap

Quick Menu Set-up

Firmware Ver

Panorama Memory
Previous

Save Previous

Recall

Camera Setup
Move Camera

EPIC Pro Menu Tree for Firmware Version 171

New Panorama
360 Panorama
Options
Time/Exposure

Mult Picture

Brackets

EV Step Size

Mirror Lock-up

Lockup-time

Shutter Teach

Start Del/trig

Pic Order

Timelapse/Series

Battery Status

Save/Load Config

Factory Reset

Expert Options

Checklist

Shutter Mode

Shutter Length

Motor Speed

Motors Rigid

Pretrigger Delay

Bracket Delay

Backlight Mode

Aspect Ratio

Picture Overlap

Last Pic Hold

Shutter Feedback

Shutter Retries

Quick Menu Setup

Firmware Ver

Test Shutter
Panorama Memory
Previous

Save Previous

Recall

Camera Setup
Move Camera
Note: Some menu items will be available dependent upon other settings.
When 'Shutter Teach' is set to "On" a small "T" icon will be displayed in the upper right hand corner. The 'Options' menu items 'Time/Exposure', and 'Brackets' will not be dis- played as they are not needed when 'Shutter Teach' is enabled. When, or if , you wish to return to the normal mode set the 'Shutter Teach' option to "Off".

When 'Options'->'Brackets' is set to a value greater than one, the 'Options'->'EV Step Size' menu item will appear.

You can also access 'Options'->'EV Step Size' from the 'Options'->'Brackets' menu by pressing the right arrow key.

Menu Options Glossary for Firmware Version 128.1
Main Menu
New Panorama – Sets the upper left photo and lower right photo that defines the rectangular area of the panorama.
360 Panorama – Sets the upper pitch and the lower pitch of a panorama that is 360 degrees and completes a full circle.
Options – Contains submenus that allow you to change more settings.

Panorama Memory – Recalls the previous panorama or a previously saved panorama. Also allows you to save a panorama. When you save a panorama you must also set a reference point. The reference point provides a method to orient the Epic Pro imager body in the same position. The reference point is in addition to placing the tripod in the same location.

Camera Setup – Any time you change the camera, lens, or zoom lens focal length you need to do a camera setup. 'Camera Setup' determines the coverage of a single photograph by measuring the vertical angles that the lens and camera sensor sees. Choose a unique point and move the lens so that the point is at the top of the lens. Then move the lens so that the unique point is at the bottom of the lens. Then the EPIC Pro knows the vertical angles and calculates the horizontal angle of view using the aspect ratio. The EPIC Pro also accounts for image overlap which has a default setting of 30%.

Move Camera – Moves the camera and lens from left to right and up and down using the directional keys.

Options Menu

Time per Pic - The amount of time that the EPIC Pro will wait until it moves the camera to the next position. It is important to allow enough time for the camera to process the current photograph and move the data to flash memory. This is the most likely reason the camera would miss a photograph.

Start Del/Trig – Enables a timer delay of (External Trigger, 15s, 30s, 45s, 1m, 2m, 5m, Timer) before the panorama capture begins. The external trigger setting is designed to work with a Canon E3 style remote shutter that is inserted in the EPIC Pro remote trigger port.

Mult Shutter – Allows you to take multiple pictures at each position during the capture of your panorama. You can take up to 20 pictures at each position.

Pic Order – Allows for different patterns of capturing the individual photographs such as (column-right, column-left, row – down, row – up).

Battery Status - Tells you what the voltage level of the batteries is. A voltage of 7.4 volts means that the batteries are fully charged. A voltage of around 7 volts means your batteries will not be able to operate the EPIC Pro for much longer.

Factory Reset - Resets certain options to their default values. The 'Camera Setup', 'Time per Pic', 'Start Delay', 'Mult Shutter', 'Pic Order', 'Saved Panoramas' and vertical field of view will be reset.

Expert Options Submenu

Checklist - If this option is set to ON, a checklist of things that need to be done in order to successfully create a technically good image are presented to the user before the panorama is taken. Selecting OFF will eliminate these prompts.

Shutter Mode - Allows you to choose how the unit will operate your camera's shutter. The settings are Remote or Manual. The Remote setting will use the electronic trigger cable to connect the EPIC Pro to the remote shutter port on your camera. If the Manual method is used, the user must manually actuate the shutter and press the OK button on the EPIC Pro to advance to the next photograph.

Shutter Length - When using autofocus with difficult subjects this setting allows you to incrementally increase the amount of time that the focus signal is asserted to achieve good focus. You can set the value to (Time per pic, 0.5s, 0.6s, ..., 2.0s, 2.2s, ..., 4.0s, 4.5s, ..., 8.0s). If the 'Shutter Length' setting exceeds the 'Time per Pic' setting, the 'Shutter Length' setting will be used. This allows you to fine tune the amount of time needed to achieve good focus separately from how much time your camera needs to sustainably write images to the Flash memory without filing up the cameras buffer memory.

Motor Speed - Options are 'Slow', 'Med,' or 'Fast'. It is recommended that you use the 'Slow' setting when using large lenses to reduce the settling time after accelerating and de-accelerating a large lens.

Motors Rigid - The 'On' setting will help hold large lenses in position when you are not in a 'Move' mode, or actively capturing a panorama.

Pre-trigger Delay (0.0s, 0.5s, 1.0s, 1.5s, 2.0s, 2.5s, 3.0s) This delay is between the EPIC Pro movements and the electronic trigger signal to your camera. This allows a lens and camera body to settle after an EPIC Pro movement. This is especially important for large and longer focal length lenses.
Backlight Mode This setting allows you to choose when the back light is in use. The options are Power Save, Always Off, Always On.
Aspect Ratio The options are 1:1, 3:2, 4:3, 16:9. The default setting is 4:3 (4 units wide to 3 units tall).
Picture Overlap (25%, 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%, 70%, 75%,) This setting allows you to increase the overlap to compensate for vignetting, or poor performance of a lens at the edges of the glass. Increasing this value may help give the stitch software more common area to find control points. The EPIC Pro default picture overlap is 30%.
Quick Menu Setup - Allows you to change which four items will be accessible from the quick menu. The quick menu is accessed by pressing and holding the left X button for one to two seconds. Useful menu items might be (Time Per Pic, Start/Del trig, Mult Shutter, Battery Status)

Panorama Memory Menu

Previous – Repeat the previous panorama. Your panorama will be lost unless you use the 'Save Previous' option before turning the power off.
Save Previous – Save the previous panorama settings to the EPIC Pro's memory, including an approximate reference point that will be used in the future to give the EPIC Pro a point of reference to begin shooting.
Recall – Recall a panorama setting from the EPIC Pro's memory that was saved using the 'Save Previous' option.

Menu Options Glossary for Firmware Version 171

Main Menu

New Panorama – Sets the upper left photo and lower right photo that defines the rectangular area of the panorama.
360 Panorama – Sets the upper pitch and the lower pitch of a panorama that is 360 degrees and completes a full circle.
Options – Contains submenus that allow you to change more settings.
Test Shutter - Allows you to optionally test your settings such as single shutter, multiple shutters, exposure bracketing, and or mirror flip-up before starting the capture of a panorama. To set, Select 'Test Shutter' from the menu. Once you press the OK button the EPIC Pro will trigger the camera with the current settings.
Panorama Memory – Recalls the previous panorama or a previously saved panorama. Also allows you to save a panorama. When you save a panorama you must also set a reference point. The reference point provides a method to orient the EPIC Pro body in the same position. The reference point is in addition to placing the tripod in the same location.
Camera Setup – Any time you change the camera, lens, or zoom lens focal length you need to do a camera setup. 'Camera Setup' determines the coverage of a single photograph by measuring the vertical angles that the lens and camera sensor sees. Choose a unique point and move the lens so that the point is at the top of the lens. Then move the lens so that the unique point is at the bottom of the lens. Then the EPIC Pro knows the vertical angles and calculates the horizontal angle of view using the aspect ratio. The EPIC Pro also accounts for image overlap which has a default setting of 30%.
Move Camera – Moves the camera and lens from left to right and up and down using the directional keys.

Options Menu

Time/Exposure - This was previously named 'Time per Pic' in firmware version 128.1 and is the amount of time that the EPIC Pro will wait until it moves the camera to the next position. It is important to allow enough time for the camera to process the current photograph and copy the data from the cameras buffer memory to the flash memory. This is the most likely reason that the camera would miss a photograph. Some cameras will light an LED while the photograph is being transferred.

Mult Picture - This was previously called 'Mult Shutter' in firmware version 128.1. This setting allows you to set the number of photographs that will be triggered per position. If you have 'Brackets' enabled, 'Mult Picture' will repeat the bracket sequence per the number of photographs you selected when setting 'Mult Picture'.
Brackets - Exposure bracketing of 1, 3, 5, 7, or 9 photographs for HDR images by working with the camera AEB (automatic exposure bracketing) firmware. Use the 'EV Step' setting to set the separation of exposure values to (0.3, 0.7, 1.0, 1.3, 1.7, or 2.0) EV (exposure value). You may exceed the capability of your camera AEB firmware by setting the 'Expert Options'->'Shutter Length' to 'Bulb' if all exposures are slower than about 1/10 of a second (such as at night).
EV Step Size - Used in conjunction with the 'Brackets' setting to capture multiple exposures per position to create HDR panoramas. You can set the exposure value separation to (0.3, 0.7, 1.0, 1.3, 1.7 or 2.0) EV. One exposure value separation is equivalent to doubling or halving the shutter speed when you keep the aperture and ISO constant.
Mirror Lockup - Is used in conjunction with the camera firmware to flip up the mirror and wait a delay of 'Options'->'Lockup-time' before triggering the shutter. When 'Mirror Lockup' is enabled in the EPIC Pro and your camera, there will be two shutter signals for each photograph taken. The first assertion of the signal will flip up the mirror. The second shutter signal will be asserted after 'Options->'Lockup- time' and will trigger the shutter. 'Mirror Lockup' is useful for longer focal length lenses where any lack of settling is amplified by the optical magnification. If you are using a large 200-400mm f/4.0 lens you might set the lockup-time to 1.8 seconds. If you are using a 50mm or 100mm prime lens you might disable 'Mirror Lockup'
Lockup-time - Is used in conjunction with 'Mirror Lockup' and your camera's mirror lockup settings. You may set a lockup-time of (0.25s, 0.50s, 0.75s, 1.00s, 1.25s, 1.50s, 1.75s, 2.00s, 2.25s, 2.50s, 3.00s).
Shutter Teach - This setting is an alternative method of defining exposure bracketing timing or multiple pictures where you "teach" the EPIC Pro how you would like the camera's shutter button to be pressed. The Pro will then remember how many times you want the shutter to be pressed as well as the extra timing between shutters. 'Shutter Teach' is located in the 'Options' submenu and the left arrow button is used to teach the imager. End the sequence with the OK button.
Start Del/Trig – Enables a timer delay of (External Trigger, 15s, 30s, 45s, 1m, 2m, 5m, Timer) before the panorama capture begins. The external trigger setting is designed to work with a Canon E3 style remote shutter that is inserted in the EPIC Pro remote trigger port.
Pic Order – Allows for different patterns of capturing the individual photographs such as (column-right, column-left, row – down, row – up).
Timelapse/Series - Used to capture a sequence of panoramas over a period of time. You may use a timer of zero seconds to 99 days or an external trigger to change when each panorama in the sequence is taken. When you choose the timer, the value includes the time to capture the panorama. When external trigger has been selected, use a Canon E3 style remote shutter that is inserted in the EPIC Pro remote trigger port.
Battery Status - Tells you what the voltage level of the batteries is. A voltage of 7.4 volts means that the batteries are fully charged. A voltage of around 7 volts means your batteries will not be able to operate the EPIC Pro for much longer.
Save/Load Config - Allows you to save up to three configurations, which is convenient when you want to quickly change lenses or bracketing options.
Factory Reset - Resets certain options to their default values. The 'Camera Setup', 'Time per Pic', 'Start Delay', 'Mult Shutter', 'Pic Order', 'Saved Panoramas' and vertical field of view will be reset.

Expert Options Submenu

Checklist - If this option is set to ON, a checklist of things that need to be done in order to successfully create a technically good image are presented to the user before the panorama is taken. Selecting OFF will eliminate these prompts.
Shutter Mode - Allows you to choose how the unit will operate your camera's shutter. The settings are Remote or Manual. The Remote setting will use the electronic trigger cable to connect the EPIC Pro to the remote shutter port

on your camera. If the Manual method is used, the user must manually actuate the shutter and press the OK button on the EPIC Pro to advance to the next photograph.

Shutter Length - The amount of time that the focus and shutter signals are asserted (Exposure (bulb), 0.5s, 0.6s, 0.7s, 0.8s, 0.9s, 1.0s, ... 2.0s, and 2.2s, 2.4s ... 4.0s, and 4.5s, 5.0s, 8.0s). You are able to incrementally increase the amount of time that the focus signal is asserted when using autofocus. You are able to quickly find a tradeoff between allowing for enough time for your camera's autofocus subsystem to achieve good focus and not requiring too much time to capture the entire gigapan. When 'Shutter Length' exceeds 'Time/Exposure', then 'Shutter Length' takes precedent. You can also use the bulb so that the remote shutter controls the exposure time when using autofocus or doing exposure bracketing to capture HDR images.

Motor Speed - Options are 'Slow', 'Med,' or 'Fast'. It is recommended that you use the 'Slow' setting when using large lenses to reduce the settling time after accelerating and de- accelerating a large lens.

Motors Rigid The 'On' setting will help hold large lenses in position when you are not in a 'Move' mode, or actively capturing a panorama.

Pre-trigger Delay (0.0s, 0.5s, 1.0s, 1.5s, 2.0s, 2.5s, 3.0s) This delay is between the EPIC Pro movements and the electronic trigger signal to your camera. This allows a lens and camera body to settle after an EPIC Pro movement. This is especially important for large and longer focal length lenses.

Bracket Delay - Time delay added to allow your camera to not overflow its memory buffer while capturing exposure brackets for HDR images. Programmable between 0.1 seconds and 8 seconds.

Backlight Mode - This setting allows you to choose when the backlight is in use. The options are Power Save, Always Off, Always On.

Aspect Ratio - The ratio of the width to height of the camera system. The default setting is 3 units wide by 2 units high which is the default setting for standard DSLR cameras. You can set 'Aspect Ratio' to the following values of width to height (1:1, 3:2, 4:3, 16:9, and custom values 0.50:1, 0.55:1, ... through 2.00:1)

Picture Overlap (25%, 30%, 35%, 40%, 45%, 50%, 55%, 60%, 65%, 70%, 75%,) This setting allows you to increase the overlap to compensate for vignetting, or poor performance of a lens at the edges of the glass. Increasing this value may help give the stitch software more common area to find control points. The EPIC Pro default picture overlap is 30%.

Last Pic Hold - Continues to assert the shutter signal after the last photograph in the panorama so that a camera does not power down. This is especially useful for the timelapse function.

Shutter Feedback - Used to automatically detect a missed photograph at each position and retry again up to ten times. You must set the camera to focus priority, set 'Expert Options'->'Shutter Retries' and connect a sync cable between the camera and the EPIC Pro. The sync cable has a PC connector at one end and a mini plug at the other end. You connect the PC connector to the camera and the mini plug to the EPIC Pro remote trigger cable port. If your camera does not include a PC connector, you can purchase a hot shoe adapter that has a PC connector.

Shutter Retries - Determines the maximum number of times to retry per position when the shutter fails to trigger. Only visible when 'Expert Options'->'Shutter Feedback' is set to ON. May be set from one to ten retries.

Quick Menu Setup - Allows you to change which six items will be accessible from the quick menu. The quick menu is accessed by pressing and holding the left X button for one to two seconds. Useful menu items might be (Time/Exposure, Pretrigger delay, Mult Picture, Battery Status, Shutter Length, Mirror Lock-up)

Panorama Memory Menu

Previous – Repeat the previous panorama. Your panorama will be lost unless you use the 'Save Previous' option before turning the power off.

Save Previous –Save the previous panorama settings to the EPIC Pro's memory, including an approximate reference point that will be used in the future to give the EPIC Pro a point of reference to begin shooting.

Recall – Recall a panorama setting from the EPIC Pro's memory that was saved using the 'Save Previous' option.

1.5 Set up the EPIC Pro

Access the Quick Menu at any time by pressing and holding the X button until the Quick Menu appears. You can choose which items appear on this menu to suit your preferences. Use the 'Expert Options' submenu item 'Quick Menu Setup' to set one of the four menu items (six menu items with firmware version 171) on the Quick Menu. You have the ability to choose one of the following items for each of the quick menu items.

Firmware version 128.1:

- Move Camera
- Time Per Pic
- Mult Shutter
- Start Del/trig
- Pic Order
- Pretrigger Delay
- Battery Status
- Motor Speed
- Shutter Length

Recommended functions to add to the Quick Menu, include: Time Per Pic, Pretrigger Delay, Battery Status, and Shutter Length.

Firmware version 171:

- Move Camera
- Time/Exposure
- Mult Picture
- Start Del/trig
- Pic Order
- Pretrigger Delay
- Battery Status
- Motor Speed
- Shutter Length
- Mirror Lock-up

Recommended functions to add to the Quick Menu, include: Time/Exposure, Pretrigger delay, Mult Picture, Battery Status, Shutter Length, and Mirror Lock-up

Setting up the Gigapan EPIC Pro

Carefully follow the steps below to capture the highest quality panoramas.

2.1 Get your equipment ready

To start shooting panoramas with the EPIC Pro, you will need:

- EPIC Pro battery and power cord (included with the unit)
- A tripod, fitted with a standard 1/4-20 tripod screw
- Digital camera and lens (Digital Camera (see the Camera Compatibility List)
- Electronic trigger cable (included with the unit)
- Camera battery and/or charger
- A memory card (at least 4 GB) Make sure you have enough memory on your memory card to take the number of pictures the panorama requires.
- A memory card reader, or your camera's USB cable

2.2 Charge and Install Batteries

Your EPIC Pro will arrive with its battery ready to be charged. There are two ways to charge the battery – you can charge the battery while it is in the EPIC Pro or remove the battery to charge it on its own.

To charge the battery inside the EPIC Pro:

1. You can charge the battery in the EPIC Pro while it is powered on or off. You can also operate the unit while the battery is charging, if there is a sufficient level of charge on the battery.
2. Insert the battery into the EPIC Pro battery compartment until the end of the battery is flush with the opening. When the battery is inserted, flip the latch clockwise to lock the battery into place.
3. Plug the power cord into the EPIC Pro battery port under the right side of the LCD display.
4. Plug the power cord into an AC wall socket. A plug icon will appear in the lower right corner of the LCD display When the EPIC Pro is powered off, the plug icon will not appear while the battery is charging.
5. Place the EPIC Pro level in a space that has ample ventilation.
6. A light on the power cord will blink red and green two times when connected to the AC source. After connecting to the battery pack, a red light will show the battery back is charging. A green light signals that the battery is now charged and ready to use.

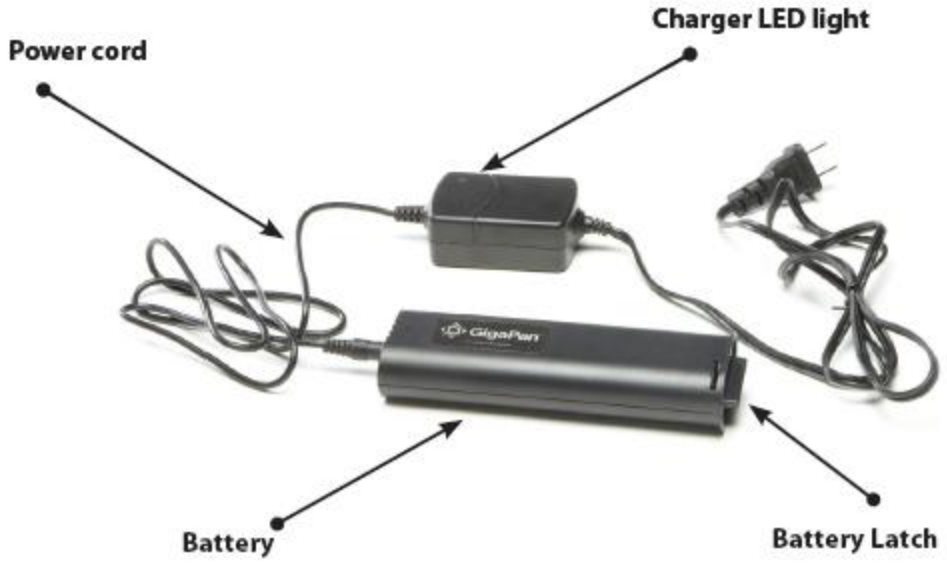
To charge the battery on its own:

1. To remove the battery from the EPIC Pro , open the battery compartment by flipping the latch counter-clockwise.
2. Plug the connector end of the power cord into the battery and then plug the power cord into an AC wall socket.
3. Place the battery level in a space that has ample ventilation.
4. A light on the power cord will blink red and green two times when connected to the AC source. After connecting to the battery pack, a red light will show the battery back is charging. A green light signals that the battery is now charged and ready to use.

To check the EPIC Pro battery status:

When the battery is low, a low battery icon will flash in the lower right corner of the EPIC Pro LCD display. When the battery is so low that proper functionality is no longer possible, a "Please recharge the battery" message will appear.

To check the battery status, press the directional keys until you reach the 'Options' menu item and press OK. Select the 'Battery Status' menu item and press OK. If the battery has just been charged, the battery status should read at least 7.4 volts. If the battery is below 7.0 volts, it needs to be charged.

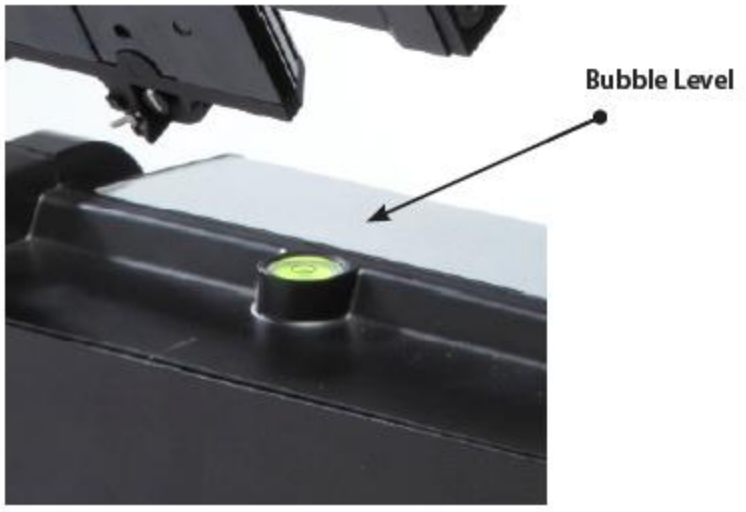


2.3 Mount the EPIC Pro on a tripod

To ensure a steady series of images, use the EPIC Pro with a sturdy tripod fitted with a standard 1/4-20 tripod screw.

1. Set up the tripod. Ensure that the legs have a solid footing on the ground and that the tripod is relatively level. If the tripod has a bubble level use it to help level the tripod. Tighten the adjustment screws on the tripod
2. Remove the tripod quick release plate and attach it to the EPIC Pro's tripod mount at the bottom.

3. Gently tighten the screw until the quick release plate is firmly attached to the EPIC Pro.
4. Clip the plate back onto the tripod.
5. Use the bubble level to center and level the EPIC Pro. Adjust the tripod legs and mount as necessary.



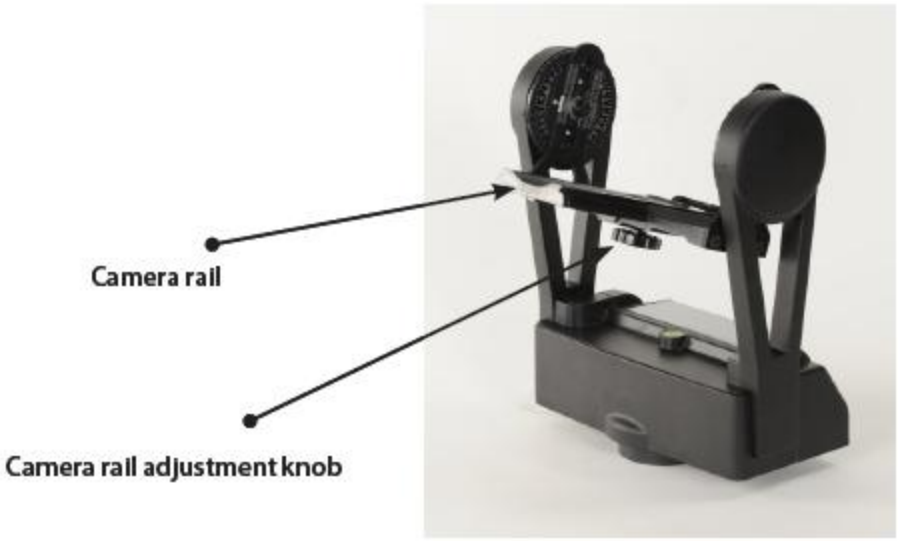
2.4 Mount your camera and lens

Use these steps below to mount your camera and lens on the EPIC Pro. Refer to the EPIC Pro diagram and part names in Chapter 1.2 as you follow these steps.

1. Turn the EPIC Pro on by pressing and holding the OK button for one to two seconds
2. Level the camera rail by pressing the down button until the ‘Move Camera’ menu item is selected. Press OK.
3. Use the up and down arrows to move the camera rail to a level position, approximately even and parallel to the base of the EPIC Pro.
4. To remove the camera mounting plate from the camera rail, find the small silver pin at the front of the camera mounting plate. Turn the small silver pin clockwise and then rotate the camera mounting plate lever clockwise. Then remove the camera mounting plate.

5. Mount either the camera body or the lens mount to the camera mounting plate. Larger lenses have a mount because a camera body is not able to support the mass and size of the lens.
6. Re-attach the camera mounting plate to the camera rail with the lens and camera attached. Ensure that it is securely fastened.
7. Loosen the camera rail by turning the camera rail adjustment knob underneath the 7. rail clockwise.
8. Slide the camera rail so that the mass of the camera and lens is centered over the axis of rotation so that the EPIC Pro can easily move the lens and is less susceptible to external forces such as wind or vibration from vehicles. If you are photographing subjects that are closer with a medium to small mass lens you may opt to adjust the lens so that the optical center is centered at the axii of rotation. This choice affects the adjustment of the rail forward or backward. It does not effect the height adjustment, which will be adjusted to the center of the lens or as close as possible.

9. Adjust the rail forward to center the mass over the axis of rotation unless you are very close to your subject. If you are close to your subject you will need to use a lens that allows you to position the camera rail so that the lens is approximately at the optical center which minimizes parallax error. This position will be close to the region of the lens between the front glass element and the focus ring in most cases.
10. Adjust the height of the camera rail and the camera mounting plate so that the center of the lens is at the level of the platform thumbscrews attached to the EPIC Pro arms. Loosen the platform thumbscrews to allow for adjustment of the camera mounting plate and lens height. A few larger cameras, such as the Nikon D3X, will not allow you to perfectly center the height of the lens to the midpoint. For the majority of usage, this should not be an issue.



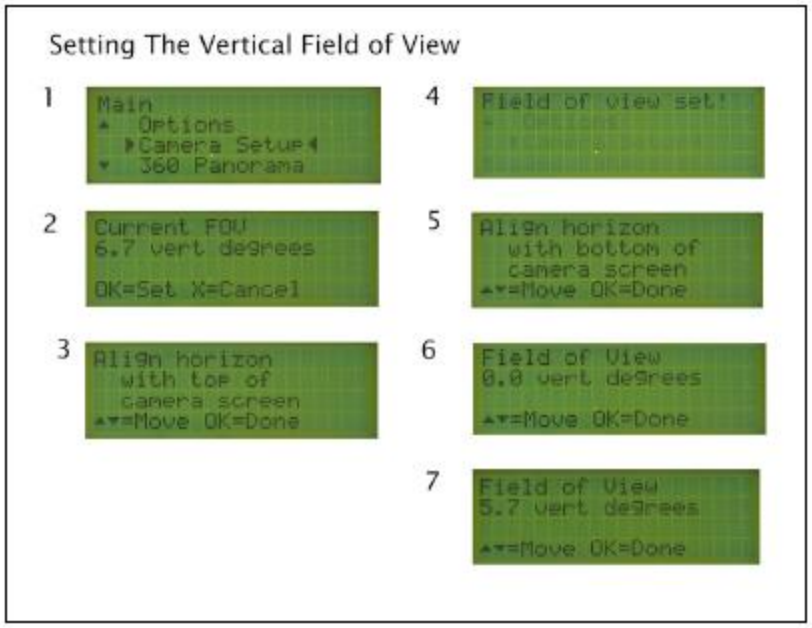
2.5 Set up your camera

Follow the steps below to optimize your digital camera settings for panorama taking.

1. Turn on your camera and select the ‘Manual mode’.
2. Adjust the focus and exposure. (ISO, aperture value, shutter speed)
3. Set your camera’s ‘White Balance’ (Daylight, Cloudy, Tungsten or Fluorescent) based on the lighting conditions. You may use a device such as an expodisc, color card, or grey card to get better white balance.
4. Connect the electronic trigger cable to the trigger cable port, which is located to the left of the LCD display. Connect the cable to the camera.
5. Set the EPIC Pro ‘Time per Pic’ in the ‘Options’ submenu to ensure enough time for the camera to be ready to capture another photograph. You need to account for the shutter speed and enought time to write the image to flash memory. It is important to allow sufficient ‘Time per Pic’ to avoid missing photos.

2.6 Setting Functions on EPIC Pro

Every time that you change lenses, camera bodies, or zoom focal length, you must perform the ‘Camera setup’ function in order to give the EPIC Pro the angle of view for your lens and camera combination. You must also perform the ‘Camera Setup’ function, if it is the first time you are using the EPIC Pro or you have performed the ‘Factory Reset’ function.



1. From the ‘Main Menu’, select ‘Camera Setup’ and press OK .
2. The first time you select ‘Camera Setup’ you will be asked if you want to set up the field of view. Set your field of view and press OK. (After setting up the field of view the first time, the current field of view will be displayed in step 2 as it is shown in the diagram above as step 7.)
3. If you have not disabled the ‘Checklist’ function under ‘Options’->’Expert Options’-> ’Checklist’ by setting it to OFF, you will be prompted to set the camera’s zoom. Press OK after this prompt.
4. Now the EPIC Pro will prompt you to align a unique point with the top of the camera viewfinder or the top of the LCD screen. Ensure you choose a feature that you can easily identify and use the directional keys to move the camera so that this unique point is at the top, middle of the lens. Press OK.
5. The EPIC Pro will momentarily display “Reference set!”
6. Now the EPIC Pro will prompt you to move the camera using the up and down keys.
7. Adjust the position of the lens so that the unique point that you chose in step 4 is located at the bottom of the lens. Press OK.
8. The EPIC Pro will momentarily display “Field of view set!”

Additional information

Verify the field of view at any time by selecting the ‘Camera Setup’ function. If you wish to preserve the current angle of view, press the X button. If you wish to change the angle of view, press the OK button and follow the directions above in Chapter 2.6.

2.7 Set manual focus or autofocus

Focus is very important when capturing panoramas with the EPIC Pro. By paying close attention to the focus both before and during shooting, you can create panoramas wih ulta high resolition and incredible clarity in their detail. By not paying close attention to focus, the amount of time and effort spent capturing a large 1000 photograph panorama may not generate as good of results as the same panorama using a shorter focal length and 400 photographs.

Manual Focus

Consistent Focus

The use of manual focus to capture a panorama reduces the risk of missing photos, inconsistent focus, or complete lack of focus. When you choose to use manual focus, you are assured that the focus will remain consistent over all areas of the panorama. You will also not need to be so concerned about missing an image in a large panorama. Consult a depth of field table to become familiar with the distances which will have an acceptable sharpness.

Maximize Depth of Field

Depth of field is a function of:

1. Aperture - diameter of diaphragm opening. Decreasing the diameter will increase the DOF. Increasing the aperture value too much, such as f/22 versus f/8 through f/16 will result in diminishing returns in sharpness due to diffraction losses.
2. Focal length - distance from image sensor plane to principle point. Decreasing the focal length will increase the DOF.
3. Distance to subject - increasing the distance to the closest point that needs to be acceptably sharp increases the DOF.
4. Size of image sensor (full frame, partial frame, point and shoot) A smaller size sensor will increase the DOF.
5. Circle of confusion - diameter of circle considered to be one point. This is not a camera setting, but a definition of what is considered to be sharp. You need to pay attention to this value so that you do not misinterpret the depth of field. When the circle of confusion diameter is increased (what is considered to be one point) the standard for what is is considered to be acceptably sharp decreases.

Plan your Panorama

If you have time to plan the capture of a panorama, the measuring tool on Google Earth allows you to measure the potential distances involved. Google Earth also has a tool for visualizing the lighting conditions with respect to the time of day and the date.

Auto Focus

There are situations when auto focus is a better choice, than manual focus for increasing the sharpness of a panorama. One example is a crowd of people or a building that are at an angle and span a large distance. You will not be able to increase the depth of field to cover the entire distance, especially if you are using a longer focal length. You can use autofocus to shift the center of focus closer or farther for each position in the panorama if you have a suitable situation for autofocus. There are advantages and difficulties with each method depending upon the particular situation. The ‘Shutter length’ setting in the ‘Expert options’ and using a faster lens with a minimum aperture value such as f/2.8 versus f/5.6 are two ways to make autofocus work better. Another important hardware consideration is the autofocus system of the particular camera body that you are using.

Potential subject problems

Multiple objects at different distances - may need to reduce focus points used or temporarily switch to manual focus for that region of the panorama. Areas devoid of discernable features - need to use manual focus for entire or part of panorama. There needs to be discernable features where the camera body focus points are located.

Moving objects - May need to repeat particular photograph or pause panorama Enough light - May need to use better equipment such as a faster lens such as f/2.8 versus f5.6. May need to use manual focus

Important auto focus camera settings include:

1. A faster lens with a lower minimum aperture value such as f2.8 versus f5.6. The aperture value is inversely proportional to the diaphragm diameter. A wider opening allows more light to hit the autofocus sensor.
2. A focus policy where a photograph is taken only if good focus is achieved versus a release policy where the photograph will be taken regardless of whether good focus has been achieved. Increase the ‘Shutter Length’ setting to increase the amount of time that the focus signal is asserted.
3. The auto focus mode such as single servo, continuous servo, or mixed.

4. The focus points that are selected.
   With Canon DSLR cameras the auto focus mode is tied to the release or focus policy.

   Nikon cameras have a default release priority or focus priority which may be changed using the camera menu system.

   You can use a combination of auto focus and manual focus in difficult lighting situations, such as blue sky, smooth water, or bright lights.

2.8 Test your set-up

You get the best panoramas when two consecutive pictures overlap by about a third. The best way to test whether your setup is all right is to take a 2x2 panorama. Use the instructions in Chapter 3 to take a panorama, and preview the images in your camera. If you don't see a good overlap despite following the instructions, go back and adjust your EPIC Pro set-up.

Good Overlap Insufficient Overlap

2.9 Minimize paralax error

Use the following tips to eliminate an effect called parallax, which causes objects to appear to have shifted when viewed from different lines of sight.

Note: If the subject of your panorama is far away, you will want to adjust the position of the camera rail forwards or backwards to balance the camera and lens instead of following these tips to minimize parallax error (See Chapter 2.4

for information about balancing the mass of your camera and lens). At further distances, it is more important that your camera and lens be stable for minimizing parallax error.

Adjust the lens position If you are capturing a panorama where the subjects include objects that are close to the lens along with objects that are farther away, you may be able to increase the image quality by adjusting the lens so that the front entry pupil of the lens is centered over the axii of rotation.

Approximate adjustments for minimizing parallax error '

Note: The approximate adjustments described above are sufficient for most instances. However, sometimes it may be necessary to make the following fine adjustments and work the extra time and effort.

1. Adjust the height of the camera by loosening the two platform thumbscrews on the EPIC Pro arms. Move the camera mounting platform up or down until the midpoint of the camera lens is located at the same height as the thumbscrew and the axis of rotation for pitch (up and down).
2. Adjust the camera rail by loosening camera rail adjustment knob. Slide the rail forwards or backwards until the entry pupil of the lens is at the same position as the middle of the arm where the platform thumbscrews on the EPIC Pro arms are located. The entry pupil is now aproximately aligned with the axis of rotation for yaw (left to right).

Fine adjustments to the camera mounting platform for minimizing parallax error

1. Find two objects in your scene that are adjacent to each other and at different distances, such as two trees at different distances or a window frame and a door. You will use these two objects to accurately repeat images at two angles with the camera rail adjusted at different points.
2. Place two additional objects that will help you consistently position the EPIC Pro at different angles. You might use two chairs and use the back of a chair just visible at the left side of the viewfinder to repeat two angles.
3. Loosen the knob underneath the camera rail and move the rail so that the estimated location of the lens entry pupil is located at the midpoint of the EPIC Pro arms, which is the yaw axis.
4. Determine the position of the camera rail using the millimeter markings on the rail.
5. Measure the distance between the two objects at the two angles for different positions of the camera rail.
6. When you find the position of the rail where the distance between the two objects changes the least number of pixels at the two different angles, you have minimized the parallax error for the yaw axis (left to right)

Using the GigaPan EPIC Pro

To shoot a panorama with the EPIC Pro, you can select ‘New Panorama’, ‘360 panorama’ or select ‘Previous’ under ‘Panorama Memory’ if you have saved a previous set-up. Remember that you will need to repeat the camera set-up instructions in Chapter 2.7 if you change lenses or focal lengths.

3.1 Start a new panorama

1. Turn the EPIC Pro on by holding down the Power/OK button. The first menu item is ‘New Panorama’.
2. Press OK to select ‘New Panorama’. The EPIC Pro will prompt you through the following steps.
3. Use the directional keys to point the camera to the top left corner of your scene, and press OK when you’re ready.
4. Now use the directional keys to point the camera to the bottom right corner of your scene, and press OK when you’re ready.
5. While you’re doing this, you’ll be able to see how many horizontal and vertical pictures the EPIC Pro is going to take.
6. The EPIC Pro will display ‘Show Panorama?’ to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
7. You’ll now need to confirm if you want to go ahead with the panorama by pressing OK.
8. Watch the scene while the EPIC Pro takes your panorama.
9. If someone steps into your frame, or if your camera misses a picture, press X to pause the panorama, use the directional keys to go back to an earlier camera position and retake the photo.
10. Access the Quick Menu at any time by pressing and holding the X button until the Quick Menu is displayed.

3.2 Shoot a 360 degree panorama

Taking a 360 degree panorama is easy and is similar to shooting any other panorama. Instead of setting the EPIC Pro to the upper left and lower right corners of the panorama, you just have to set it to the top and bottom.

1. Use the directional keys on the EPIC Pro to navigate to '360 Panorama' in the menu and press OK.
2. Use the directional keys to point the camera to the top of your scene and press OK.
3. Use the directional keys to point the camera to the bottom of your scene and press OK.
4. The EPIC Pro will display 'Show Panorama?' to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
5. Confirm whether you want to go ahead with the panorama by pressing OK.
6. Watch the scene while the EPIC Pro takes your panorama to make sure it does not miss a picture and no one steps into your frame. If so, press X to pause the panorama and use the directional keys to go back to an earlier camera position.

3.3 Repeat a previous panorama

The EPIC Pro can save the data for your previous panorama, so you can repeat it and correct it if something went wrong with your first try, or if you just want to try the same panorama with a different camera setting.

Following are different options for repeating a panorama.

To save a previous panorama for future use:

1. After finishing shooting your panorama, use the directional keys to select 'Panorama Memory' in the main menu and press OK.
2. Select 'Save Previous' and press OK.
3. To save a prevous panoroama, the EPIC Pro requires a reference point in order to return to the same position. Move the camera to a reference point and press OK.
4. The EPIC Pro will display 'Reference Set!' and 'Panorama Saved!'

To recall a previous panorama:

1. Use the directional keys to select 'Panorama Memory' in the main menu and press OK
2. Select 'Recall' and press OK.
3. To recall a previous panorama, the EPIC Pro requires a reference point in order to return to the same position. Move the camera to the reference point you selected and press OK.
4. The EPIC Pro will display 'Reference Set!' and 'Taking Panorama!'
5. The rest of the process is the same as any other panorama.

To repeat a previous panorama:

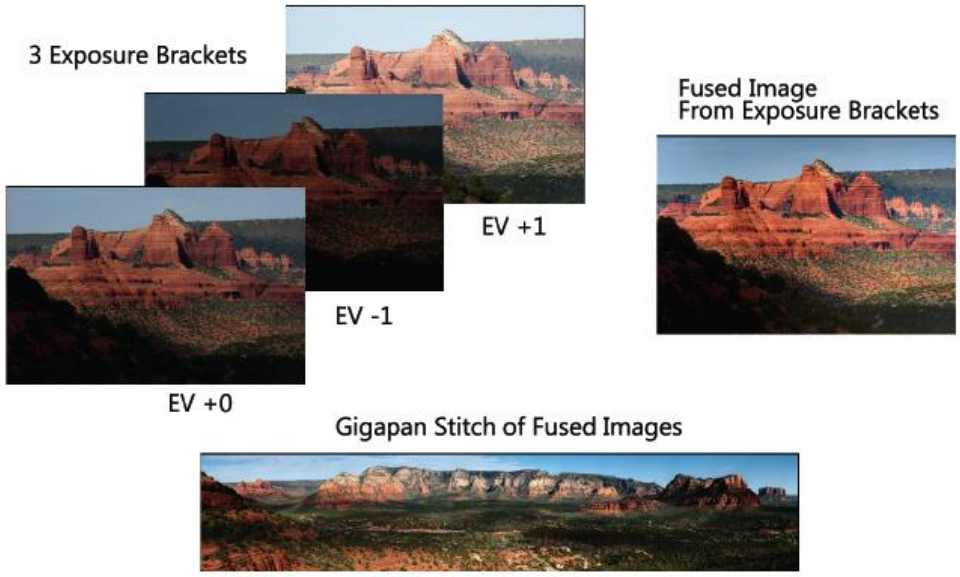
It is not necessary to use a reference point to repeat the last panorama unless you physically move the EPIC Pro.

1. Use the directional keys to select 'Panorama Memory' in the main menu and press OK.
2. Select 'Save Previous' and press OK.
3. The EPIC Pro will display 'Show Panorama?' to let you preview the panorama before it begins. Press OK if you want it to, or press X to continue without a preview.
4. The rest of the process is the same as any other panorama.

EPIC Pro Additional Instructions and New Features

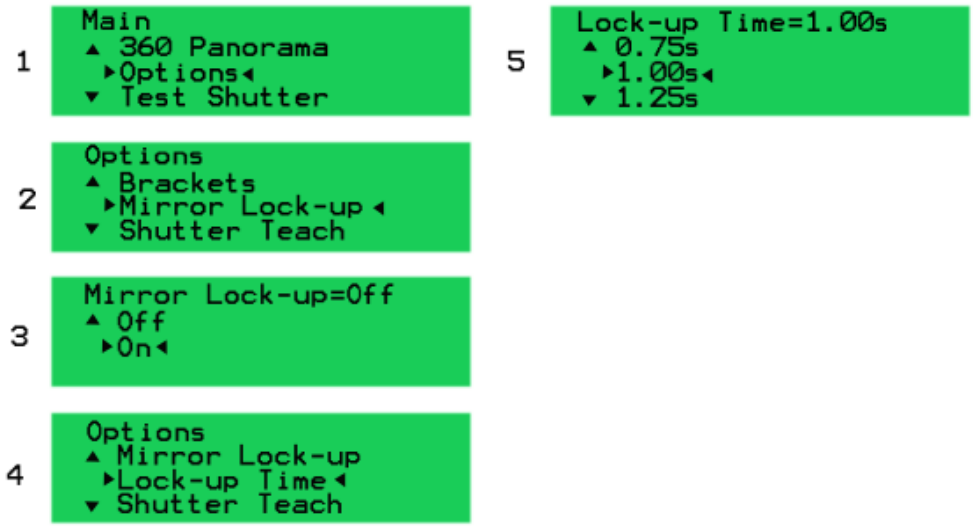
To shoot a panorama with the EPIC Pro, you can select ‘New Panorama’, ‘360 panorama’ or select ‘Previous’ under ‘Panorama Memory’ if you have saved a previous set-up. Remember that you will need to repeat the camera set-up instructions in Chapter 2.7 if you change lenses or focal lengths.

4.1 Exposure Bracketing to Capture HDR images



When your panorama has areas with significantly different amounts of light, such as shadows, neutral colored rock, and blue skies, a single exposure will not yield all of the detail that you can see with your own eyes. This is especially true for panoramas that cover a large field of view. You can improve the overall exposure by capturing multiple photographs with different exposures for each position. You do this by using the EPIC Pro ‘Brackets’ setting and the ‘EV Step Size’ setting. The panorama shown above is a good example because it has a very large horizontal field of view with areas that have shadows.

Basic Exposure Bracketing Settings



1. Select the ‘Brackets’ setting in the EPIC Pro ‘Options’ submenu and press OK.
2. Use the down arrow to select three exposure brackets and press the OK button.
3. Now that ‘Brackets’ is set to a number greater than one, the ‘EV Step Size’ menu item will appear below the ‘Brackets’ menu item. Select ‘EV Step Size’ and press OK. Now select the 1.7 EV separation setting and press OK.
4. Choose whether you are going to use the camera AEB (automatic exposure bracketing) or the BULB mode where the EPIC Pro controls how long the shutter is asserted. In order to use the BULB mode, all of the shutter speeds need to be slower than about 1/10 of a second. If you are photographing during the day and want to use the BULB mode, then you will need to use a good quality neutral density filter.

Frequently Asked Questions

1. What changes exposure and why should I only vary the shutter speed?

When you capture multiple exposure brackets for each position for the purpose of capturing HDR images, you vary the exposure by varying the shutter speed and keeping the ISO, and aperture constant. Do not vary the aperture because it will change the depth of field.

2. What does EV (exposure value) mean?

An increase of one full exposure value means that you double the amount of light. You can do this by doubling the shutter speed from one second to two seconds. A decrease of one full exposure value means that you decrease the amount of light by one half. One full exposure value less than one second is one half second.

Exposure Value	-2	-1	0	+1	+2
Shutter speed	1/4 s	1/2 s	1 s	2 s	4 s
Canon	4	0”5	1”	2”	4”

Nikon	4	2	1”	2”	4”

(*see note below regarding quotations)

3. What is a simple method of determining the center exposure, number of brackets, and the exposure value separation?
Use an evaluative metering mode to determine the center ‘Time/Exposure’ setting and then simply choose three brackets with a larger EV separation such as 1.7 EV or 2.0 EV.

4. What is an accurate method of determining the number of brackets and the exposure value separation?
Determine the exposure for the brightest, average, and darkest areas that you would like to be able to see details. Use the following steps:

- Change the metering mode to spot mode, if your camera has that capability.
- Point the camera lens to each area and depress the shutter button half way to determine the shutter speed that will center the reflective meter marker to zero. Take note of the shutter speeds as you do this.
- Determine the distance from the average exposure which you use to set ‘Time/Exposure’. Do this by counting how many shutter speeds settings your darkest and brightest shutter speeds are away from your ‘Time/Exposure’ setting.
- The default setting for shutter speeds in DSLR cameras is 1/3 stop. When you change the shutter speed three times you have changed the exposure by one exposure value or one EV.

Set the metering mode on your camera to spot meter
Please refer to your camera’s user manual for specific information. See table below for instructions on setting the metering mode for each of the following cameras.

Canon 5D Mark II	Canon Rebel T1i	Nikon D700	Nikon D90
Small WB button on the top right hand side of the camera. Use the small dial on top of the camera to select spot meter.	Press the set button in the middle of the directional buttons on the back right hand side of the camera. Use the buttons that surround to navigate to the icon that is on the right hand side and the third row up. Press the set button again. Use the left and right buttons to select spot metering.	There is a dial that is to the right of the eye piece. Rotate the dial counter clockwise until it points at the single dot. This sets the metering type to a spot meter.	Use the Center-Weighted Area metering mode. The default circle is 8mm. You can change this to 6mm for a smaller spot. This is changed in Custom settings B menu underneath b3 center weighted area. There are other metering settings that can affect metering.

**The cameras use the quotation mark similar to the way the North American decimal point is used. In Europe, the comma is used to denote the decimal point. DSLR viewfinders will display only the denominator if the shutter speed is a fraction while the LCD will display the entire fraction.*
Two methods are shown below. The first method simply requires you to count the number of shutter values required to travel between each extreme to the average exposure. The second method requires you to divide by two or multiply by two until you reach the other meter reading. Let’s use an example where you meter 1 second in the

shadows, 1/4 second average exposure, and 1/160 of a second in bright areas where you want to be able resolve details.

Method One

EV distance from brightest area to average exposure using 1/3 EV shutter settings

1/160	1/125	1/100	1/80	1/60	1/50	1/40	1/30
0	1	2	3	4	5	6	7
0 EV	1/3	2/3	+1 EV	4/3	5/3	+2 EV	7/3

1/25	1/20	1/15	1/13	1/10	1/8	1/4
8	9	10	11	12	13	14
8/3	+3 EV	10/3	11/3	+4 EV	13/3	14/3

EV Distance from shadows to average exposure using 1/3 EV shutter settings

1”s	0”8	0”6	0”5	0”4	0”3	1/4
0 setting	1	2	3	4	5	6
0 EV	1/3	2/3	-1 EV	4/3	5/3	-2 EV

Set your camera shutter speed to the brightest 1/160 second meter reading and then change the shutter speed and count how many settings it takes to reach the average 1/4 second meter reading. With default camera settings you will count fourteen shutter dial changes in order to reach 1/4 second. Divide 14 by 3 and you get 4 EV with 2/3 EV remaining. The distance from the shadow meter reading is smaller at six shutter speed setting changes on the dial which equals -2 EV. So the distance is 4 and 2/3 EV plus 2 EV for a total of 6 2/3 EV distance to cover the entire range.

If you are using a Nikon (D200, D300, D300S, D700S, D3, D3s, D3x) with a nine EV span or a Canon (1D Mark III, 1D Mark IV, 1Ds Mark III) with a span of seven EV you are able to capture these exposures using the cameras AEB function.

You can move the center exposure which is what you set the ‘Time/Exposure’ setting to and lose 2/3 stops of desired dynamic range. Another option is to use a good neutral density filter to shift all of the exposures to shutter speeds that are slower than about 1/10 of a second and use the BULB setting on the camera and the imager. If you use the bulb setting on the camera and the imager then the imager opens and closes the shutter instead of the camera’s AEB

function. Change the imager to BULB mode by changing the ‘Options’->’Expert Options’->’Shutter Length’ to ‘Exposure’ (bulb).

Method Two

EV distance from brightest area to average exposure by multiplying exposure by two

1/160 s	1/80	1/40	1/20	1/10	1/5
0 EV	+1 EV	+2 EV	+3 EV	+4 EV	+5 EV

EV distance from shadows to average exposure by dividing exposure by two

1”	1/2	1/4
0 EV	-1 EV	-2 EV

5. How do I fuse, or tone map the exposure brackets before stitching with the Gigapan Stitch software?

When using Gigapan Stitch to align and render your panorama along with exposure bracketing, you will need to use a fuser or tone mapper with batch capability to consistently apply the same settings to each set of exposure brackets. The resulting fused or tone mapped images are then stitched by Gigapan Stitch. Some of your fusion or tone mapping options are:

- Photomatix 4.0 - www.hdrsoft.com
- Enfuse (freely available) - enblend.sourceforge.net
- Enfuse GUI wrapper - software.bergmark.com/enfuseGUI/Main.html
- HDR Expose - www.unifiedcolor.com/hdr-expose

Preview your exposure brackets with a file browser or Adobe Bridge, adjusted so that an entire exposure bracket sequence is displayed on each row. Review the rows checking to see that features match and that you did not miss any exposure brackets. If you are fusing the exposure brackets with Enfuse and the Enfuse GUI wrapper you should convert the files to 16 bit TIFF format before fusing them. Photomatix and HDR Expose can process camera RAW and other formats.

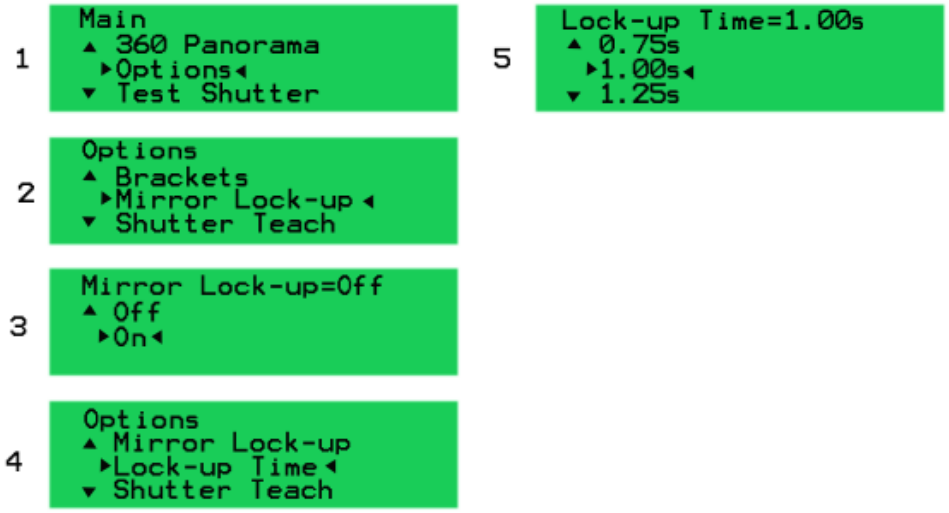
When using the fusion or tone mapping software it is often necessary to adjust several parameters to achieve realistic looking results. Fusion will yield realistic results with less intervention. Common parameters that you might need to change are strength, color saturation, exposure bias, and the black level.

Once you have processed your exposure brackets and produced fused or tone mapped files, you are ready to stitch your panorama using the Gigapan Stitch software. See Chapter 4 for more information about Gigapan Stitch software.

4.2 Mirror Lock-up

The ‘Mirror Lock-up’ function is used to flip the mirror up and wait a programmable delay that is independent of the ‘Time/Exposure’ delay before actuating the shutter. ‘Mirror Lock-up’ is especially important for longer focal length

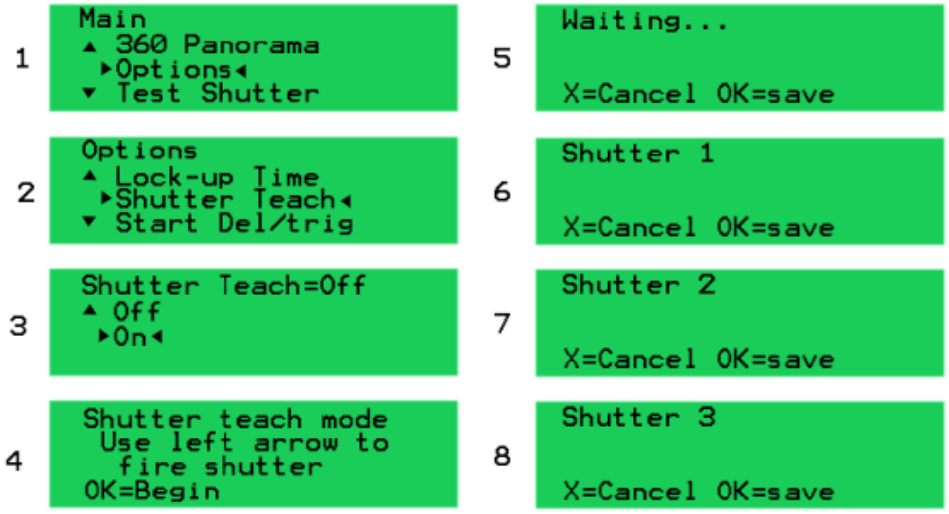
lenses that are larger and heavier. The longer focal length indirectly means that the magnification is greater and that any lens movement is magnified more, and more likely to cause blurry photographs.



1. Select the ‘Options‘ submenu from the EPIC Pro ‘Main Menu’.
2. Select the ‘Mirror Lock-up’ menu item and press OK.
3. Select the value ‘ON’ and press OK.
4. The menu item ‘Lock-up Time’ will appear once you have enabled ‘Mirror Lock-up’. Select ‘Lock-up Time’ and press OK.
5. Choose a value that is appropriate for the stability of your lens size and mass, and press OK. A larger and heavier lens will require more time to settle. Choosing too long of a lock-up time will increase your capture time.

4.3 Shutter Teach

The ‘Shutter Teach’ function is an alternative method of setting the timing for exposure bracketing or multiple pictures. The EPIC Pro enters a teaching mode where you press the left directional button at each point in time you want the it to take a photograph.

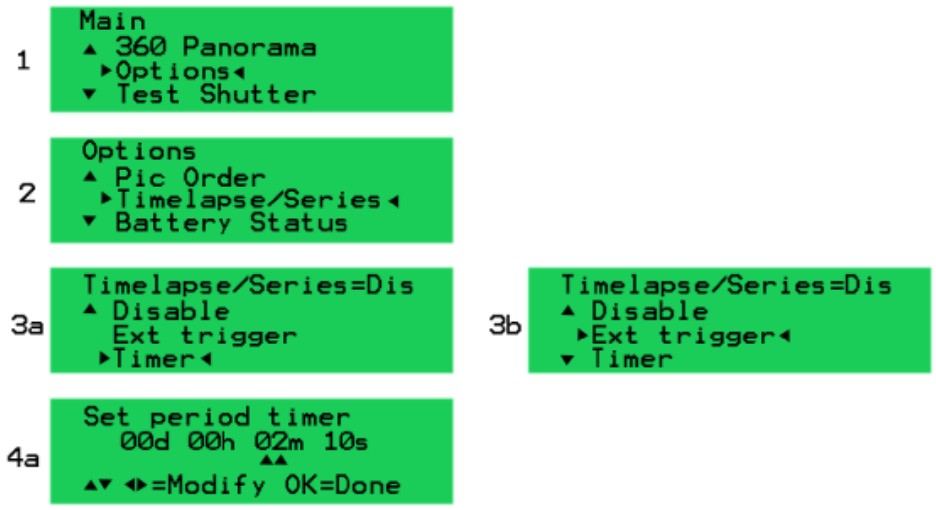


Basic Settings

1. First, configure your camera with the bracketing or multiple exposure mode you wish for your panorama.
2. Next, select the ‘Options’ submenu from the EPIC Pro ‘Main Menu’ and press OK.
3. Scroll to the ‘Shutter Teach’ menu item and press OK.
4. Select ‘ON’ and press OK. You will now enter “shutter teach mode”.
5. The display will ask you to use the left arrow button to tell the EPIC Pro when to trigger the shutter.
6. Press the OK button when you are ready to begin teaching the EPIC Pro when to trigger. Press the left arrow button as if you are pressing the camera’s shutter button. The EPIC Pro will mimic your actions and actuate the shutter on the camera.
7. When you have pressed the left arrow button for the last picture to be taken, you need to tell the EPIC Pro how long to wait before it moves to the next position in the panorama. You do this by pressing OK after the last left arrow button press.
8. Now the EPIC Pro has been taught how many times and when to trigger the shutter. The display now has a small “T” for teach mode at the upper right hand corner of the LCD display.
9. You can now start a new panorama from the ‘Main Menu’ and the EPIC Pro will use the shutter information you just taught it.

4.4 Timelapse/Series

You can use the ‘Timelapse/Series’ function to take a series of panoramas over a period of time. You can use either the external trigger and a remote, or a timer to tell the EPIC Pro when to start each successive panorama.



Basic Settings

1. Select the ‘Options’ submenu from the EPIC Pro ‘Main Menu’.
2. Select the ‘Timelapse/Series’ menu item.
3. Select either ‘Timer’ or ‘Ext trigger’ and press OK.
4. If you chose ‘Timer’ then you will need to set the amount of time that elapses between the start of each panorama. Use the left and right buttons to switch between day, hour, minutes, and seconds. Use the up and down buttons to change the actual value that is highlighted by two upward arrows. Press OK when you have set the desired amount of time.
5. If you chose ‘Ext trigger’ then you will need a remote shutter device with a Canon E3 mini plug style connector. It can be wired or wireless. Connect it to the remote trigger port on the EPIC Pro.
6. Now return to the ‘Main Menu’ by pressing the X button. Select ‘New Panorama’ from the main menu.
7. After setting up the ‘New Panorama’ the EPIC Pro will capture the panorama and either wait for the timer or a button press from the remote shutter that is connected to the remote trigger port.
8. When you want to exit the repeated capture of panoramas, press the X button to quit.

Additional information

Some things to consider before starting a time lapse series:

- If you are mounting the EPIC Pro on a structure or a pole, is it secure? Will it present a danger to any people in the area if it falls? Safety first.
- How are you going to power the EPIC Pro and the camera body?
- How are you going to store all of the images?
- Is the equipment protected from weather such as rain?

4.5 Save/Load Config

There are three configuration memories A, B, and C that you can use to save settings. The configurations may allow you to save a significant amount of time switching between lenses or cameras.

Saving or Loading a configuration

1. From the EPIC Pro ‘Main Menu’, select the ‘Options’ sub menu and press OK.
2. Select the ‘Save/Load Config’ menu item and press OK.

3. Select one of the configuration memory locations A, B, or C and press OK.

4.6 Last Pic Hold

When the ‘Last Pic Hold’ function is set to ‘ON’, the EPIC Pro will keep the half button press signal asserted so that the camera is ready for the next panorama. This is very useful for time lapse panoramas.

1. From the EPIC Pro ‘Main Menu’ select the ‘Options’ submenu and press OK.
2. From the ‘Options’ sub menu select the ‘Expert Options’ submenu and press OK.
3. Select the ‘Last Pic Hold’ menu item and press OK.
4. Select the ‘ON’ and press OK.

4.7 Shutter Feedback

The ‘Shutter Feedback’ function tells the EPIC Pro whether the shutter was triggered by using the strobe signal from the PC connector or hotshoe. When ‘Shutter Feedback’ is set to ‘ON’ and a cable is connected along with a shutter speed that is less than 1/250s the camera will attempt to take a photograph the number of times set in the ‘Shutter Retries’ function.

1. From the EPIC Pro ‘Main Menu’, select the ‘Options’ sub menu and press OK.
2. From the ‘Options’ submenu select the ‘Expert Options’ sub menu and press OK.
3. Select the ‘Shutter Feedback’ menu item and press OK.
4. Select the ‘ON’ setting and press OK.
5. The ‘Shutter Retries’ menu item will now appear in the menu since ‘Shutter Feedback’ is set to ‘ON’. Select the ‘Shutter Retries’ menu item and press OK.
6. Select the number of times that you want the EPIC Pro to retry triggering the shutter and press OK.
7. Connect the optional user supplied cables PC end to the camera body’s PC connector. Connect the mini plug end of the cable to the remote trigger port of the EPIC Pro. The remote trigger port is located underneath the right hand side of the EPIC Pro LCD panel. Note, that you can buy a hotshoe adapter if your camera does not have a PC port.
   NOTE: The ‘Shutter Feedback’ function is good at detecting when the shutter has not been actuated, but it may not detect a successful shutter trigger after a failure. So once you see that a shutter failure has occurred, watch the retries by the EPIC Pro.

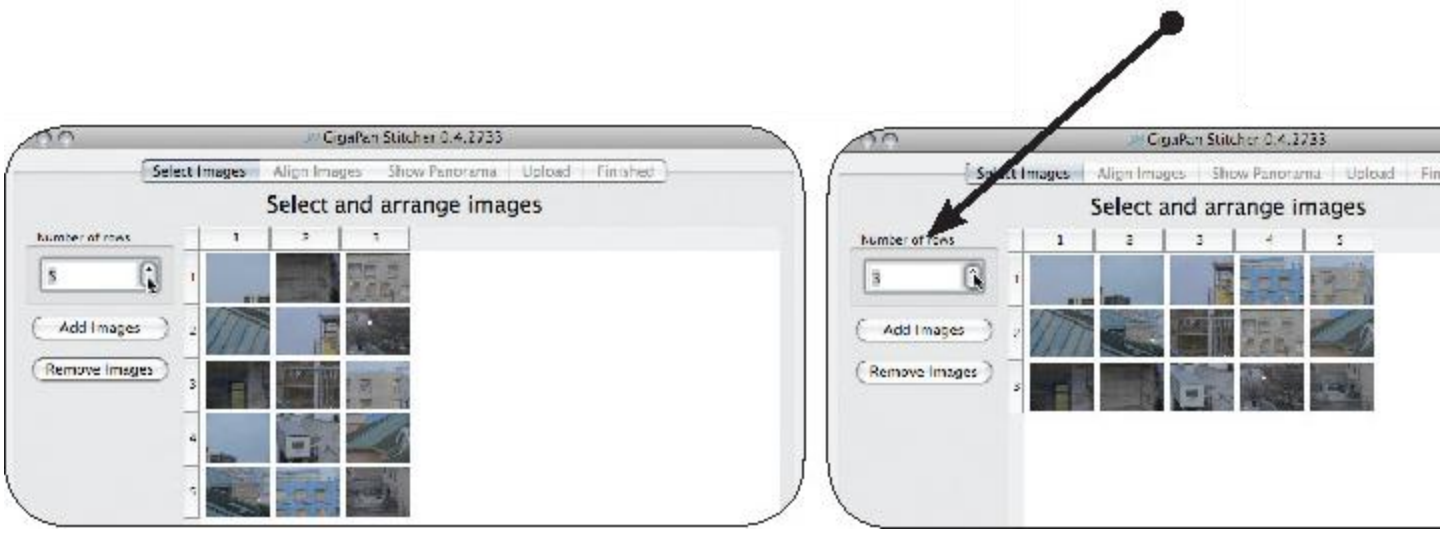
Stitching and Uploading Panoramas

GigaPan Stitch Software automatically takes all your photos and combines them into one big panorama. Once that´s done, you can upload it to GigaPan.com, our community site, for everyone to see. You´ll need an Intel based Mac or PC with at least 1 GB of RAM (more is better) to stitch photos. The more powerful your computer, the less time required to stitch panoramas. To upload to the GigaPan.com site, your panorama must be at least 50 megapixels (or an average of 35 or more pictures have been stitched together in a single panorama).

5.1 Using GigaPan Stitch Software

1. Start the GigaPan Stitch Software – you´ll find it under Start > Programs > GigaPan Stitch Software in Windows, or under Applications on the Mac. To allow the GigaPan Stitch Software work faster, quit all other programs.
2. Click on Add Images. The pictures must be in JPG format.
3. Select the photographs you took for the panorama from the folder where you´ve saved them on your computer. Hold down [Shift] to select many images at a time. It´s all right if you don´t remember the file names – just select the ones you think apply. You can remove the duplicate or extraneous ones or add more photos later.

4. The photos will appear scrambled initially. Change the Number of Rows so they line up properly.

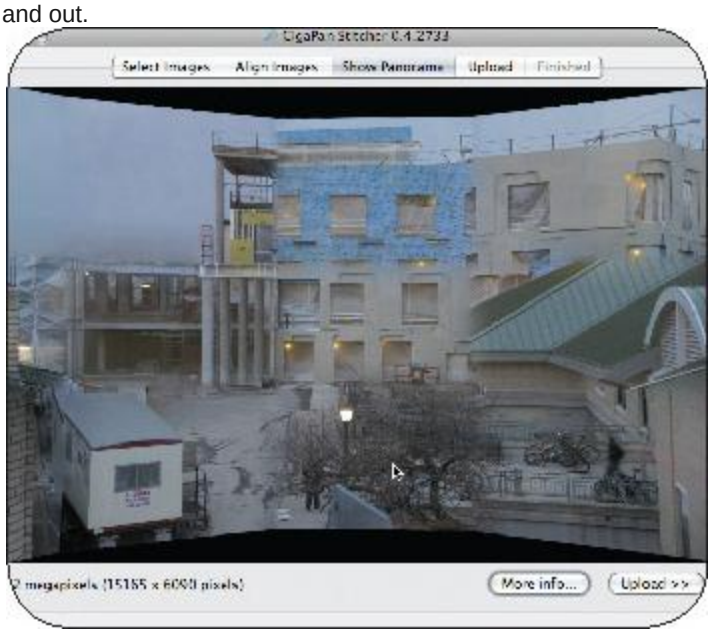


5. If you want to remove a photo, click on it and choose Remove Images. To select multiple photos, click and drag the mouse over them.

Note: GigaPan Stitch Software won´t work unless each column has an equal number of photos.

6. When you´re ready, click Done.
7. Save your panorama. Huge panoramas can take up a lot of space on your drive – they can each take up 100 MB or more – so be sure to have plenty of free space.
8. Take a break!
   GigPan Stitch software needs all your computer´s power to align and blend your photographs. Allow time for this process.
9. Once your panorama is stitched, you can explore it by clicking on it and dragging it. To zoom in, use your mouse´s scroll wheel. If your mouse doesn´t have a scroll wheel, hold down the right button and drag the mouse to zoom in

and out.



10. To save this panorama as an image, select File > Export stitched image to > TIFF or Adobe RAW
11. If your panorama is larger than 50 megapixels, you can upload it and can share, explore and take snapshots.

5.2 Additional GigaPan Stitch Options

To access these additional stitching options click on the "Options" button on the left side of the stitching software.

Image shooting order Your options are columns - right, columns - left, rows - down, or rows - up.
The EPIC and stitching software default is columns - right; remember to change it in the stitching software if you change your shooting order in the EPIC.

Combine images in draft mode

Draft mode causes seams between images to be visible, but speeds up stitching some.
This option removes the blending step of the process, which speeds up stitching and could be useful for quickly checking what your image will look like. This option is typically not necessary.

Build panorama at 50% scale

Using 50% mode will cause a loss of detail, but speeds up stitching and results in a gigapan with 1/4 as many pixels as normal. This could be useful for larger images that you may be printing instead of zooming into, so the extra detail isn´t necessary; or when you know that your input images are a little blurry; or if you´d like to save upload time.
Keep the 50 megapixel minimum limit on uploads in mind, however.
For example: if normal stitching would have yielded a 160 megapixel panorama, the "50% scale" option would generate a 40 megapixel panorama, which would be too small to upload.

Use larger blending region

A larger blending region is useful if transitions between images appear too hard-edged and abrupt.
Mercator projection instead of spherical/equirectangular
The mercator projection doesn´t squash objects above or below the horizon, but cannot be used in Google Earth.

5.3 Share your panoramas online

To share your panoramas with the GigaPan community, please join www.GigaPan.com and then upload.

1. Join GigaPan.com

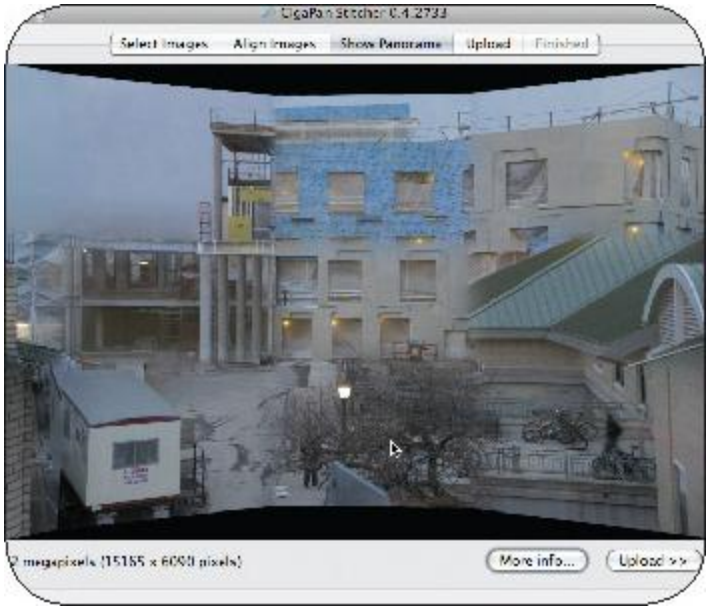
1. Visit www.gigapan.com in your browser.
2. Click on Sign-up to create a free account.

3. You can now upload your own panoramas and take snapshots, comment on other images, and share your experience on the forum!

2. Uploading to GigaPan.com

Once your panorama has been stitched and you´re happy with it, you can upload it to GigaPan.com.

1. Give your panorama a name and a description. The more detail you provide, the more easily it will be found in searches.
2. Give it a few tags – words that describe what you've photographed. For example: Halloween, backyard, winter, and so on. You can use as many tags as you want; separate them with a comma.



3. If you want only a select few to see your panorama, check the box against Private. This way, only people you give the panorama´s URL to can view it.
4. Enter your GigaPan.com user name and password, and click on Upload now.
5. Once you have uploaded your panorama, it'll give you a URL to view it online. People can now view your panorama, zoom in and out, take snapshots of parts that they like and things they find. They can also leave comments for you. If you checked Private before uploading, this is the URL you send to the people youwant to share the panorama with.

5.4 Upload using third-party software

If you used a third-party tool like Adobe Photoshop to create your panoramas, you can upload them using the GigaPan Uploader, which also installs when you install the GigaPan Stitch Software.

1. Start the GigaPan Uploader (Start > Programs > GigaPan Uploader in Windows, or under Applications on the Mac)The interface of the Uploader is identical to the Upload screen in the Stitcher.
2. Click Browse to select the panorama you want to upload.
3. Give your panorama a name and a brief description.
4. Give it a few tags – words that describe what you´ve photographed.
5. If you want only a select few to see your panorama, check the box against Private. This way, only people you give the panorama´s URL to can view it.
6. Enter your GigaPan.com user name and password, and click on Upload now.
7. Once the Uploader has uploaded your panorama, your will receive a URL to view it online. People can now view your panorama, zoom in and out, take snapshots of parts that they like, and leave comments for you. If you checked Private before uploading, this is the URL you send to the people with whom you want to share the panorama.

Explore and Share

Enjoy thousands of brilliant gigapixel panoramas from around the world. Share, discuss, snapshot and more.

6.1 View and Share

At GigaPan.com, you can:

- Explore thousands of GigaPans from around the world, take snapshots, comment and share.
- Discover amazing ways GigaPans are being used to communicate, promote, document and provide an amazing new vision.
- Learn how to create your own GigaPans, groups and galleries

6.2 Embed your panorama

You can easily embed your panoramas on another website with all the functionality of the GigaPan Viewer to pan and zoom.

1. Log-in to GigaPan.com, and select 'My Home' to view your panoramas.
2. Choose a panorama, and click on the 'Embed' link below it to access the Embedding Wizard.
3. The Embedding Wizard provides a list of customizable features that will automatically generate the appropriate HTML code for embedding a panorama.
4. First, select an initial view. Select 'Entire Panorama' option to embed your entire panorama just as it appears on GigaPan.com.
5. Or, select 'A Specific Snapshot' to have the embedded panorama load pre-zoomed to a snapshot of your choice. If you select 'A Specific Snapshot', click on the desired snapshot and its ID number will appear above its title and description. Enter the ID number in the text field.
6. To include additional snapshots in your embedded panorama, simply click on the desired snapshot and its ID number will appear above its title and description. Enter the snapshot ID number in the text field.
7. If you choose to include multiple snapshots, separate each ID number with a comma. (Note: the order in which you enter the snapshots will be the order that they will appear in your embedded panorama, and can be ordered however you'd like.)
8. You can include up to ten snapshots in your embedded panorama.
9. Once you've used the Embedding Wizard to customize your embedded panorama, click 'Generate HTML'. Copy the HTML code paste into your website. To preview your embedded panorama, click View Now'.
10. Additional options for embedding your panorama:
    - You can choose to hide the navigation controls affixed inside the viewer (Note: a user can still navigate the panorama using keyboard controls).
    - You can also choose to have your panorama's title (in white text on a blue background from GigaPan.com) displayed above the GigaPan Viewer. The title also serves as a link to your panorama's URL on GigaPan.com. If you choose not to display the title, the GigaPan' watermark is also a link to GigaPan.com.

To embed a panorama owned by someone else, please contact the author for permission and a copy of the embed code. Click on the author's name to view his or her profile, and select Send a message'.

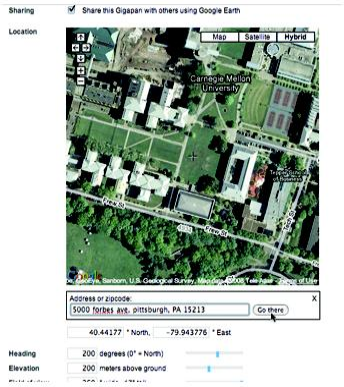
6.3 Place your panorama on Google Earth

Share your panoramas with the world in Google Earth. There is a GigaPan layer where you can explore GigaPan panoramas from around the world. Recording your panorama's location using GPS will make it easier. You'll need Google Earth 4.2 or higher to share your panoramas. You can download Google Earth from http://earth.google.com.

1. Log into GigaPan.com and go to My Home.
2. For the panorama you want to place on Google Earth, click on Place this Panorama in Google Earth.You will be prompted to download a file called gigapan_placement.kml. (Some browsers will download this file automatically)
3. Save gigapan_placement.kml to your hard disk.
4. Open gigapan_placement.kml in Google Earth. You will most likely see your GigaPan hover in mid-air.

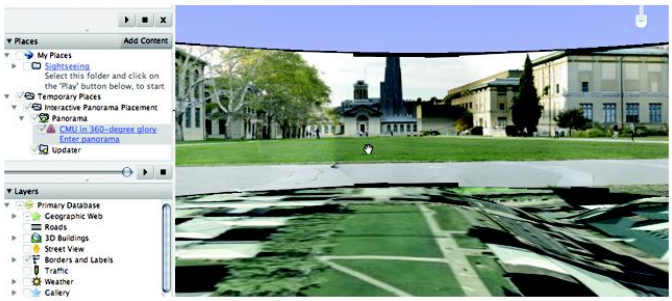
5. Leave Google Earth open, and go back to your browser window.
6. Choose Share this Gigapan with others using Google Earth.
7. There are three ways for you to specify the location of your panorama:
   a. If you recorded your coordinates using a GPS receiver, enter them in the text boxes below the map.

   b. If you know the address that you took the panorama from, click on the Have an address? link, enter the address in the text box, and choose Go there.



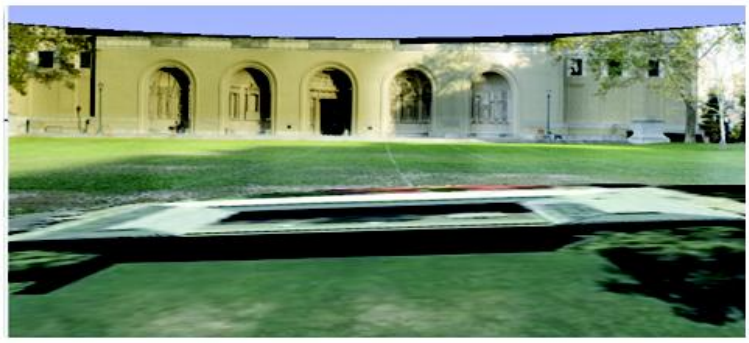
c. If you have neither GPS co-ordinates nor and address, click and drag the map till the crosshairs are directly above the spot you took your photo from. Use the + and – buttons to zoom in and out of the map respectively.

8. If you switch back to Google Earth, you'll see that these changes are made immediately
9. In Google Earth, double-click on your panorama to enter it.



10. In your browser window, drag the Elevation slider to the left to bring the panorama closer to the ground. Use Google Earth to judge your accuracy. Note: Google Earth doesn't accept zero as a value for elevation.

11. Drag the Heading slider to change the orientation of the panorama. For accurate results, try to match elements in your panorama with corresponding elements on the ground in Google



Earth.
12. If your panorama still doesn't look right, click on advanced placement options.
13. Drag the Image plane slider to bring the panorama closer to the camera.
14. Drag the Image floor slider to match the horizon in the panorama with the horizon in Google Earth.
15. If you took your panorama at an angle, use the Camera tilt and Camera roll sliders to rotate the panorama.
16. Tweak these settings till you're satisfied.
17. When you're done, click on Save Changes.
18. To exit your panorama in Google Earth, click on Exit Photo.

EPIC Pro Troubleshooting

Read on to find out how to fix common problems with the GigaPan EPIC Pro. If you don’t find your solution here, contact technical support at GigaPanSystems.com.

7.1 My photos are blurry

There could be several causes for blurry photos:

1. 1. The EPIC Pro might be moving before your camera has captured the photograph.
   a. Navigate to ‘Options’ > ‘Time Per Pic’ in the EPIC Pro menu.
   b. Use the directional keys to increase the time that the EPIC Pro will wait before moving. This is especially useful for nighttime panoramas.
2. The moving EPIC Pro platform might not have sufficiently settled before the photograph is taken.
   a. Navigate to ‘Options’ > ‘Expert Options’ > ‘Pretrigger Delay’ in the menu.
   b. Set the ‘Pretrigger Delay ‘to a higher value to allow for more settling time.
   c. Navigate to ‘Options’ > ‘Expert Options’ > ‘Motor Speed’
   d. Set the ‘Motor Speed’ to ‘Med’ or ‘Slow’ to allow for more settling time.
   e. Shoot a test panorama while watching for settling through the camera viewfinder. If more settling time is needed, pause the panorama by pressing the X button and then adjusting the ‘Pretrigger Delay’ using the Quick Menu. (See

Chapter 1.5 or instructions on programming ‘Pretrigger Delay’ in the Quick Menu). Note: When you are using larger and heavier lenses it is especially important to adjust the ‘Pretrigger Delay’ and ‘Motor Speed’ settings.

3. Wind gusts or vibration might have disturbed the lens and camera.
   a. Use a faster shutter speed that is at least the reciprocal of the lens focal length. If you are using a 300mm lens, then attempt to use a shutter speed that is at least 1/300th of a second. Consider increasing the ISO to allow for a higher shutter speed if there is not enough light.
   b. Attempt to shield the lens and EPIC Pro from the wind by placing it to the side of an object such as a tree, car trunk, or a large collapsible portrait reflector. In extreme conditions, consider placing the EPIC Pro inside of a small camping tent.
   c. Consider taking two or three photographs per position at the same exposure to increase the probability that one of the photographs is not blurry if the disturbance is intermittent.
4. Auto focus may not be yielding consistently focused images.
   a. Navigate to ‘Options’ > ‘Expert Options’ > ‘Shutter Length’ in the EPIC Pro Menu. Increase the value of the ‘Shutter Length’ setting to a value greater than ‘Time per Pic’ to permit the autofocus sub system longer to achieve good focus.
   b. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. Aminimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.
   c. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

   (See Chapter 2.8 for more information on auto focus)

7.2 My photos have a narrow depth of field

There are several factors that affect the depth of field. You can increase the depth of field on your camera by:

- * increasing the aperture value
- decreasing the focal length
- increasing the distance to your subject
- using a smaller size image sensor
- using auto focus to shift the critical focus if appropriate You can also consult a depth of field chart provided by your lens manufacturer. There is a point at which you will experience diminishing returns in image quality while increasing the aperture value to maximize the depth of field. The image will begin to be degraded by diffraction losses if you use to high of an aperture value such as f/22 versus f/8, f/11 or f/16. You may be able to use auto focus to increase the sharpness of your panorama depending upon your subject, available light, lens, and camera. Using auto focus allows you to move the critical focus for each position in your panorama.

  (See Chapter 2.8 for more information on auto focus)

7.3 My camera is missing pictures, or the first exposure

There could be several causes for your camera to miss pictures:

1. 1. The EPIC Pro’s platform is moving faster than your camera can take pictures.
   a. Navigate to ‘Options’ > ‘Time per Pic’ in the EPIC Pro Menu.
   b. Use the directional keys to increase the time that the EPIC Pro will wait before moving.
2. While using auto focus you did not focus the lens before starting your panorama.
   a. Press the shutter button on your camera halfway to engage the focus system and achieve good focus before starting your panorama.
3. Autofocus is not achieving focus and not taking pictures.
   a. Navigate to ‘Options’ > ‘Expert Options’ > ‘Shutter Length’ in the EPIC Pro Menu. Increase the value of the ‘Shutter Length’ setting to a value greater than ‘Time per Pic’ to permit the autofocus sub system longer to achieve good focus.
   b. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. A minimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.

c. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

7.4 The electronic trigger cable is not actuating the camera shutter

There are a few common reasons why the electronic trigger cable might not be actuating the camera shutter.

1. Ensure that the electronic trigger cable is connected to the camera body and to the EPIC Pro on the left of the LCD display.
2. Verify that a memory card has been inserted into the camera and that it is not full.
3. Verify that the camera is powered and that there is sufficient charge on the EPIC Pro battery to complete a panorama. (See Chapter 2.2 for checking battery status.)
4. If you plan on using manual focus, verify that the lens is in the manual focus mode.
5. If you plan on using auto focus, ensure that you are able to achieve focus by pressing the shutter button half way to engage the auto focus sub system.

   (See Chapter 2.8 for more information on auto focus)

7.5 The electronic trigger cable is not allowing the camera to autofocus

1. Navigate to ‘Options’ > ‘Expert Options’ > ‘Shutter Length’ in the EPIC Pro Menu. Increase the value of the ‘Shutter Length’ setting to a value greater than ‘Time per Pic’ to give your auto focus sub system longer to achieve good focus.
2. If you have a faster lens (lower minimum aperture value such as f/2.8) consider using this lens. Note that a zoom lens will normally have two values printed on the lens. A minimum effective aperture at the shortest focal length and then a slower effective aperture at the longest focal length.
3. Check the servo mode or release policy of the servo mode. Different camera manufacturers use different terms for the servo modes. Typically a single servo mode uses a focus policy where the camera will not actuate the shutter unless the auto focus system communicates that a good focus was achieved. On some cameras you can change the default focus policy to a release policy where the photograph will be captured regardless of whether the camera achieves good focus. Continuous servo modes typically have a default policy of release where the trigger will be actuated regardless of the whether the camera achieved a good focus. Release policy can cause more problems than it solves depending upon your equipment and the subject you are photographing.
4. Consider using manual focus or a mixed manual focus and auto focus approach with areas such as sky, water, plain walls that do not contain detailed features.

   (See Chapter 2.8 for more information on auto focus)

7.6 My panoramas are distorted or misaligned

There could be several causes for distorted or misaligned panoramas:

1. Check your setup for errors.
   a. Go through the Set-up steps in Chapter 2. Note: Remember that you must repeat this every time you change the camera, lens or focal length.
   b. Make sure that your camera is tightly mounted on the EPIC Pro unit.
   c. Make sure that the EPIC Pro is firmly mounted on your tripod.
   d. Make sure that your tripod is on steady ground.
   e. Make sure that nothing disturbs the EPIC Pro while it’s taking photographs.
2. Make adjustments for vertical or horizontal lines in your panorama. GigaPan Stitch aligns the larger elements of photos, and thus might ignore vertical or horizontal lines such as poles and window frames.
   a. Try to avoid taking panoramas with too many vertical lines in the foreground.
   b. Try using a third-party tool to stitch your panorama.
3. Check and adjust the platform’s forward-back position. If you’re taking macro panoramas (that is, really close to the subject), you’ll need to adjust the position of the platform.
   a. Turn to Chapter 2.9: Reduce Paralax Error.
   Note: This is a time-consuming process, and should only be used when necessary. However, it may be necessary for panoramas that have subjects that are both close and far away, and macro panoramas.

7.7 My computer freezes while GigaPan Stitch is working

The GigaPan stitching software needs a lot of processing power to stitch panoramas, and will use up nearly 100 percent of your CPU, leaving little for other programs. In addition, larger panoramas need more power, and take more time. So while it might appear that your computer is frozen, it's just GigaPan Stitch working hard. Ideally, you should avoid work ing on your computer while the stitching software is running.

To monitor GigaPan Stitch in Windows, turn on the Task Manager ([Ctrl] + [Shift] + [Esc]). If GigaPan Stitch reports "Not Responding" , use the 'report a bug' feature under the 'help' tab of GigaPan Stitch or contact tech support via GigaPanSystems.com.

On the Mac, you can monitor GigaPan Stitch using the Activity Monitor ('Applications' > 'Utilities '> 'Activity Monitor)'. If GigaPan Stitch reports "Not Responding" , use the 'report a bug' feature under the 'help' tab of GigaPan Stitch or contact tech support via GigaPanSystems.com.

7.8 My panoramas have vignetting

Vignetting is the result of less light reaching the edges and corners of a photo than the center of a photo. Vignetting manifests itself as a pattern of stripes in a panorama. You can adjust camera settings to minimize vignetting and you can reduce vignetting using an image editor before stitching the photos together.

Methods of minimizing vignetting while capturing photos

1. Reduce the diameter of the camera's diaphragm by using a larger aperture value such as f/8 versus f/4. The aperture value is inversely proportional to the diameter of the diaphragm opening.
2. Use a smaller focal length such as 200mm versus 400mm.
3. Use a petal type lens hood or no lens hood.
4. Newer Nikon and Canon cameras have vignetting compensation settings that help reduce vignetting for supported lenses. Nikon vignetting correction controls are located in the custom function menu. Newer Canon cameras support 'peripheral illumination' settings for certian lenses.
5. Increase the amount of overlap to an percentage higher than the EPIC Pro default of 30% using the 'Picture Overlap' setting in the EPIC Pro Menu.

Post processing photographs to remove vignetting before stitching

At times you may need to rely on editing your photos in post-production because your camera adjustments during the capture of the panorama were not enough to eliminate vignetting or the settings would have prevented you from capturing the images due to low light conditions. Note that you are able to adjust jpeg format images to minimize vignetting, but you are able to make a more aggressive adjustment to files that are in the camera RAW format.